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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/581,446	07/11/2006	Toshiki Origuchi	3273-0225PUS1	2164
2292 7590 09/29/2008 BIRCH STEWART KOLASCH & BIRCH PO BOX 747 FALLS CHURCH, VA 22040-0747				
EXAMINER				
SALVITTI, MICHAEL A				
ART UNIT		PAPER NUMBER		
4131				
NOTIFICATION DATE		DELIVERY MODE		
09/29/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

# Office Action Summary

**Application No.**

10/581,446

**Applicant(s)**

ORIGUCHI ET AL.

**Examiner**

MICHAEL SALVITTI

**Art Unit**

4131

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☒ Claim(s) 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/S5/ICE)
- Paper No(s)/Mail Date 06/01/2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Specification***

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Silicon-Crosslinked Vinyl-Urethane Copolymers and Productions Methods Thereof.

### ***Claim Objections***

2. Claim 16 is objected to because of the following informalities: The phrase 'hydrolyzabel gorup' is used. Please correct the spelling on these two terms.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-16 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,426,158 to *Mueller et al.*

Claim 1 of the instant application cites a vinyl-urethane copolymer wherein the vinyl chain and urethane chain are linked by at least one segment containing a silicon-oxygen bond. *Mueller* discloses polymer compositions of this type,

with silicon-substituted urethane monomers and methyl methacrylate as a vinyl component (see Example 48, column 16, lines 15-23 for one example).

As to claim 2 wherein the urethane polymer chain is a residue of a urethane polymer:

- (A) *Mueller's* urethane polymers have at least one silicon-containing hydrolysable group (see Example 45, column 15, lines 35-54) wherein a silylated urethane polymer formed from the condensation of triisocyanate and a tetramethyl disiloxane.
- (B) The vinyl chains are made from ethylenically unsaturated monomers such as *N,N*-dimethylacrylamide (see column 15, lines 43-44).
- (C) Example 45 of the *Mueller* patent describes a compound wherein at least one functional group is a silicon-hydrolysable group and at least one end is an ethylenically unsaturated bond-containing group (Example 36, column 12 uses tetrahydroxyalkylpoly(dimethylsiloxane)).

Claim 3 is anticipated by *Mueller*, wherein the poly(siloxane-urethanes) form an interpenetrating-polymer-network (IPN) with the vinyl polymers (column 8, lines 5-13).

Claim 4 is anticipated by *Mueller*. Example 45 (column 15) displays a silicon polymer chain derived from a silicon-containing hydrolysable group of a

urethane polymer, reacting with an ethylenically unsaturated compound (N,N dimethyl acrylamide), and a silane is present (1,3-bis(4-hydroxybutyl) tetramethyl disiloxane).

Claim 5, citing an alkoxysilated urethane polymer capable containing a hydrolyzable group and a hydrophilic group, is disclosed by *Mueller* (Example 36, column 12 uses tetrahydroxyalkylpoly(dimethylsiloxane)).

Claim 6 of the instant application is discussed in the specification of *Mueller* (column 5, lines 50-68 and column 6, lines 1-11). Several hydrophobic monomer precursors of the urethane polymer are discussed (including isocyanates with naphthyl and benzyl moieties, and aliphatic chains among other hydrophobic possibilities). When prepared as specified, they will contain alkoxysilated terminal groups (see first paragraph of the "Synthesis" section in the *Mueller* patent).

Claim 7 is anticipated by Example 45 of the *Mueller* patent, which uses an alkoxysilylated urethane polymer containing at least one hydrophilic group (polymerization of triisocyanate with 1,3-bis(4-hydroxybutyl) tetramethyl disiloxane); at least one hydrophilic group and having at least one terminal alkoxysilyl group, containing plural isocyanate-reactive groups and having no hydrophilic group; a compound, containing at least one hydrophilic group and plural isocyanate-reactive groups; a polyisocyanate compound; and an alkoxysilane compound containing at least one isocyanate-reactive group.

Claim 8 citing a silane compound having a silicon-containing hydrolyzable group which is an alkoxy group-containing silane compound, has been disclosed by *Mueller*. In Example 36, column 12, tetrahydroxyalkylpoly(dimethylsiloxane) is used.

Claim 9, claiming an acrylic monomer as the vinylic component is anticipated by *Mueller* (Example 45 uses N,N dimethylacrylamide as a vinylic component).

Claim 10 which describes a monomer containing a functional group reactive with a silicon-containing hydrolysable group and at least one functional group reactive with an ethylenically unsaturated bond-containing group, is anticipated by *Mueller*. In column 6, lines 56-60, methacryloxypropyl-tris(trimethylsiloxy)silane is a component which meets the demands of claim 10 in the instant application.

Claim 11 details a method of making the vinyl-urethane copolymer comprising steps (X) and (Y)

As to step (X), *Mueller* discloses the preparation of aqueous urethane having at least one silicon-containing hydrolyzable group (column 6, lines 14-39).

As to step (Y), *Mueller* discloses:

(A): a urethane polymer containing at least one hydrolysable group (column 6, lines 14-29).

(B): an ethylenically unsaturated monomer polymerization  
(column 6, lines 30-34).

(C): utilizing a group containing a silicon-hydrolyzable group  
with at least one ethylenic unsaturation (see  
methacryloxypropyl-tris(trimethoxy)silane, column 6  
lines 58-59).

Claim 12 is rejected with regard to Example 45 of the *Mueller* patent.  
Example 45 describes a process of synthesizing a polysiloxane-polyurethane  
polymer, adding N,N-dimethylacrylamide and an initiator to form the product.  
Step (Y1-b) reads on this method.

Claim 13 is rejected with regard to Example 45 of the *Mueller* patent.  
Example 45 describes a process of synthesizing a polysiloxane-polyurethane  
polymer, adding N,N-dimethylacrylamide and an initiator to form the product.  
Step (Y2-a) reads on this method.

Claim 14 reads on Example 46 of the *Mueller* patent which uses  
methacryloxypropyltris(trimethylsiloxy)silane as an unsaturated silane.

Claim 15 reads on Examples 38-39 of *Mueller*, which perform the  
reaction neat with the disclosed monomers acting as the solvent. The reaction is  
followed by treatment with water up to 100°C for 7 days (Example 39, column 13,  
lines 13-30).

Claim 16 is anticipated by *Mueller*. Example 45 discloses the use of 1,3-bis(4-hydroxybutyl) tetramethyl disiloxane. The siloxane moieties of this compound are hydrolyzable whereas the hydroxyl moieties are hydrophilic.

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- U.S. Patent No. 5,109,057 details a similar composition used as a primer.
- U.S. Patent No. 7,172,809 details a similar composition as a clear coat.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL SALVITTI whose telephone number is (571)270-7341. The examiner can normally be reached on Monday to Friday 8AM to 5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Sample can be reached on (571)272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.



Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/David R. Sample/  
Supervisory Patent Examiner  
Art Unit 4131

M.S.